

UNIT 1 — Introduction to E-Commerce (7 Hrs)

EC vs E-Business

- EC: buying/selling/exchanging goods, services, info over networks.
- E-Business: broader — EC + internal ops, CRM, SCM, e-learning. $EC \subseteq E\text{-Business}$.
- Pure EC: product+process+delivery all digital (e-book). Partial EC: one dimension physical (book bought online, shipped) = brick-and-click.

EC Framework (pillars)

- People, Public Policy, Marketing/Advertising, Support Services, Business Partnerships — all on Technology Infrastructure.

Classification of EC

Type	Meaning
B2B	Business-Business
B2C	Business-Consumer
C2C	Consumer-Consumer
C2B	Consumer-Business
B2G	Business-Govt
G2C	Govt-Citizen

Benefits / Limitations

- Benefits: global reach, low cost, 24x7 access, personalization, social benefit (less traffic/pollution).
- Barriers-Technical: security standards, bandwidth, legacy integration.
- Barriers-Non-tech: trust, privacy fear, legal/tax issues, high setup cost.

Electronic Markets & Internet/Web Role

E-market = online space matching buyers/sellers. Internet = network backbone; Web = interface (sites, hyperlinks) enabling EC globally, cheaply, in real time.

Social Networks / SNS

- Social commerce, community building, viral marketing, social-media customer service.

M-Commerce

- EC over wireless handheld devices. Attributes: Ubiquity, Reachability, Convenience, Localization/Personalization.
- Location-based (l-commerce): uses GPS/cell-tower/Wi-Fi position for targeted offers, navigation.
- Infrastructure (bottom→top): Positioning/GPS → Wireless networks → Mobile devices/OS → Middleware → Applications.
- LBS uses: navigation, proximity marketing, emergency location, fleet tracking, check-ins, location games.

UNIT 2 — Network Infrastructure for E-Commerce (8 Hrs)

I-Way (Information Superhighway)

- High-capacity global network of networks carrying EC traffic (like a digital highway system).
- Components: access roads/local networks (ISP links), local on/off ramps, regional networks (backbones), global information distribution networks (submarine cables, satellites).
- Internet = core network infrastructure of the I-Way; provides universal, low-cost interconnection for EC.

Wireless Application Protocol (WAP)

- Standard/protocol for accessing internet content on mobile/wireless devices with limited display, memory, bandwidth.
- Architecture: Client (mobile device + microbrowser) → WAP Gateway (translates WAP↔HTTP, encodes/decodes) → Web/Content Server (WML content).
- Working: device sends request via WAP protocol stack → gateway converts to HTTP, forwards to web server → server responds (WML/XML) → gateway encodes to binary → device renders on microbrowser.

Wireless Technologies

Tech	Key Point
ADSL	Wired broadband; asymmetric (faster download)
WiMAX	Wide-area wireless broadband (WMAN)
WLAN	Wireless LAN — local area, e.g. office/home
WMAN	Wireless Metropolitan Area Network (city-scale)
Wi-Fi	Short-range wireless LAN standard (802.11)
UMTS (3G)	3rd-gen mobile broadband, higher data rates
LTE (4G)	4th-gen — high speed mobile broadband
5G NR	5th-gen New Radio — ultra-fast, low latency

Wireless Security Issues

- Eavesdropping/sniffing over open air medium, rogue access points, weak/no encryption, war-driving, device theft/loss, authentication weaknesses, interference/jamming (availability).

UNIT 3 — Introduction to Management Information System (8 Hrs)

Data, Information, CBIS

- Data: raw, unprocessed facts. Information: processed data with meaning/context for decisions.
- CBIS (Computer-Based IS): hardware+software+data+procedures+people working together, computer-supported.
- IS Resources: people, hardware, software, data, network resources.

MIS & Types of Information Systems

System	Purpose
MIS	Summarized reports for middle management decisions
TPS	Records day-to-day routine transactions
DSS	Supports semi-structured/unstructured decisions with models
EIS	Summarized strategic info for top executives

SCM & CRM

- SCM: manages flow of goods/info/finances from supplier → manufacturer → customer.
- CRM: manages interactions/relationships with customers to improve retention & sales.

Enterprise Systems & Challenges

- Integrated systems (e.g. ERP) unifying business processes across departments.
- Challenges: high cost, complex implementation, change resistance, data migration, staff training, customization vs standard process fit.
- Managing implementation: top-management support, phased rollout, user training, change management.

International Information Systems

- Outsourcing: hiring external (often domestic) firm to handle IT/business functions.
- Off-shoring: relocating processes/IT work to another country for cost/skill advantage.

UNIT 4 — EC Security and Fraud Issues and Protections (10 Hrs)

Terminology

- Vulnerability(weakness) → Threat(danger) → Exposure(potential harm) → Attack(exploit) → Risk(likelihood x impact). Countermeasure = defense.
- Attacks: Passive (eavesdrop, no change) vs Active (modify/disrupt). Attackers: hackers, cybercriminals, corporate spies, insiders, hacktivists, state actors.

6 Security Requirements

Req.	Meaning
Confidentiality	Info hidden from unauthorized users
Integrity	Data unaltered / accurate
Availability	System/data accessible when needed
Authentication	Verify claimed identity
Authorization	Define permitted actions
Non-repudiation	Cannot deny sending/receiving

Technical Malware Attacks

- Virus: attaches to file, spreads on execution. Worm: self-spreads over network, no host needed.
- Trojan: disguised as legit software, opens backdoor. Heartbleed: OpenSSL bug leaking memory/keys.
- DDoS: many bots flood server → denies service. CryptoBlocker/Ransomware: encrypts files, demands payment.
- Page hijacking: redirects legit page traffic. Botnet: network of infected bots under attacker control.
- Malvertising: malicious code in online ads. Sniffing: captures/reads network packets.

Non-Technical (Social Engineering) Attacks

- Phishing: fake trusted emails/msgs to steal credentials. Pharming: DNS-level redirect to fake site.
- Identity theft/fraud: steal personal info → misuse for fraud. Spam: bulk unsolicited msgs, often carrying phishing/malware.

EC Defense Strategy

- Access control: Authentication (know/have/are factors) + Authorization (permissions). Biometrics: fingerprint, face, iris, voice, signature.
- Symmetric encryption: 1 shared key, fast, key-distribution problem.
- Asymmetric encryption: public key (encrypt, shareable) + private key (decrypt, secret) — solves key distribution.
- CA (Certificate Authority): trusted 3rd party binds public key to verified identity via digital certificate.
- SSL/TLS: asymmetric handshake exchanges symmetric session key → fast encrypted session (https + padlock).

Securing EC Networks

Tech	Function
Firewall	Filters traffic by rules (IP/port/protocol)
VPN	Encrypted tunnel over public network
IDS	Detects + alerts suspicious activity
IPS	Detects AND actively blocks attacks

UNIT 5 — E-Payment Systems (6 Hrs)

Online Payment Cards

Card	Key Point
Credit card	Borrow now, pay bank later (with interest if unpaid)
Charge card	Full balance due each period, no revolving credit
Debit card	Deducts directly from bank account instantly
Smart card	Embedded chip stores data/value; supports secure ID/payment

Card Processing & Procedure

- Steps: Customer submits card info → Merchant sends to Payment Gateway → Gateway → Acquiring Bank → Card Network → Issuing Bank authorizes/declines → confirmation flows back → funds settled/captured.

E-Micropayments & E-Checking

- E-micropayment: very small-value online transactions (e.g. articles, in-app items) with low processing overhead.
- E-checking: electronic version of paper check; processed via ACH-like clearing between banks.

Automated Clearing House (ACH)

Electronic network for batch-processing credit/debit transfers between banks (payroll, e-checks, direct debits) — cheaper than card networks.

Mobile Payments (Digital Wallet)

- Stores card/bank/loyalty info on a mobile device app for tap/QR/in-app payment.
- Participants: consumer, merchant, mobile wallet provider, issuing bank, payment network.
- Issues: security of stored data, interoperability, regulation, fraud, adoption/trust.

International Payments & Emerging Systems

- International: currency conversion, cross-border regulation, higher fees/delay, correspondent banking.
- Cryptocurrency: decentralized digital currency using blockchain (e.g. Bitcoin) — no central authority.
- Virtual currency: digital money usable in specific virtual/online ecosystems, not always blockchain-based.

Nepal — Emerging Online Payment Trends

- Growth of wallets (eSewa, Khalti), mobile banking, QR payments, connectIPS; NRB regulation of digital payments; increasing but uneven adoption/digital literacy across urban-rural areas.

UNIT 6 — Launching a Successful EC Website (10 Hrs)

Planning Online Business

- Business plan: defines goals, market, strategy, financials for the venture.
- Cost-benefit & risk: weigh setup/running cost vs expected returns; assess market, tech, financial risk.
- Funding: self-funding, loans, investors/venture capital, crowdfunding.
- EC model selection: choose B2B/B2C/C2C etc. and revenue model (sales, subscription, ads, commission).

Building the Website

- Hierarchical site structure: home → category pages → sub-category/product pages (tree-like navigation).
- Hosting & domain: register domain name, choose hosting plan, manage via cPanel, upload EC site files to the web server.

Web Content Creation & Management

- Content types: text, images, video, product data, reviews.
- Content management: creating, editing, updating, archiving content (often via a CMS).
- Catalog content management: organizing product listings, descriptions, pricing, categorization for easy browsing/search.

Website Design Criteria

- Site map & navigation: clear structure so users/search engines find pages easily.
- Page layout grid: consistent alignment/columns for readability and visual order.
- Colors & graphics: brand-consistent palette, optimized images for fast loading.
- Usability & performance: intuitive UI, accessibility, fast load times, mobile responsiveness.

Promotion, Payments & SEO

- Website promotion: social media, email marketing, ads, affiliate/referral programs.
- Implementing payment system: integrate gateway (cards, wallets, ACH) securely (SSL/PCI compliance).
- SEO: optimize keywords, meta tags, content, backlinks, site speed to rank higher on search engines.

— End of Cheat Sheet — Good luck! —